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Clinical profile of children with pneumonia admitted at tertiary care hospital, Belgaum: A prospective study

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ABSTRACT

Background: Acute respiratory infections (ARIs) are a public health problem in India. Timely intervention, correct treatment, and referral service can save many deaths, particularly pneumonia. **Objective:** This study aimed to study the sociodemographic and clinical profile of children hospitalized with pneumonia and its relation to the duration of stay at a tertiary care center at Belgaum district, Karnataka. **Methodology:** The study was conducted in Belagavi Institute of Medical Sciences, a referral hospital, during 2013-2015. Sociodemographic and clinical features of children aged from more than 2 months to 18 years of age were studied. A total of 84 children who met the inclusion criteria for community-acquired pneumonia were studied. The patient population comprises mainly of the low-income group from rural areas, urban slums, referred patients from surrounding rural areas, and private clinics. **Results:** A total of 84 children were studied, 48 boys and 36 girls. Maximum numbers of children were in low socioeconomic group (43 in upper lower and 37 in lower group) according to modified Kuppuswamy classification. Passive smoking was present in 40.5% of studied and overcrowding was seen in 51% of children studied. 44% of children were breastfed for <6 months, and 30.64% were partially immunized. There is a significant association between passive smoking, delayed medical attention, and duration of stay. **Conclusion:** With this study, we can conclude that children who got early medical attention (<4 days) stayed for less period of time in the hospital (<7 days). Children exposed to passive smoking had a longer duration of stay.

Key words: *Acquired pneumonia, Acute respiratory infection, Hospital, Passive smoking, Acute respiratory infection, Hospital*

Acute respiratory infections (ARIs) are responsible for about 30-50% of visits to health facilities and about 20-40% of hospital admissions. Children below 5 years of age suffer five episodes of ARI per child per year, thus accounting for about 238 million attacks globally [1].

The incidence of pneumonia is more than 10-fold higher (0.29 episodes vs. 0.03 episodes), and the number of childhood-related deaths from pneumonia ≈2000-fold higher in developing than in developed countries [2]. These differences are due to a number of factors. First, the incidence of risk factors such as malnutrition, crowding, low birth weight, human immunodeficiency virus, and the lack of measles and pneumococcal immunization is much higher among children in developing countries [3-6]. Second, they are more likely to be affected by other likely or possible risk factors such as zinc and vitamin A deficiency, poor maternal education, and living in polluted areas [3-6]. Finally, there are profound differences between developing and developed countries in the organization and efficiency of their health systems [7].

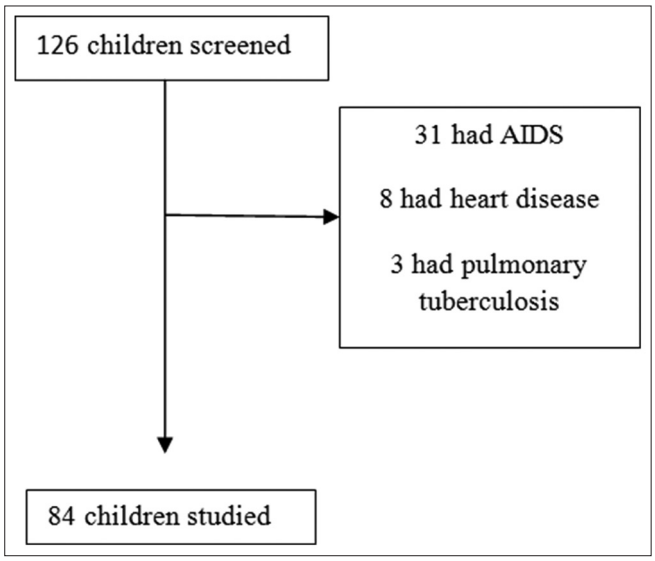
Young age, low birth weight, undernutrition, overcrowding, indoor air pollution, lack of exclusive breastfeeding, anemia, lack of parental education, lack of measles immunization, comorbidities such as congenital heart diseases, and other congenital anomalies are the risk factors for ARI that is being studied [8]. In India, recent estimates in under fives suggest that 13% of deaths and 24% of the national burden of disease are due to pneumonia [9]. Hospital-based studies have reported that 20-30% of admissions in under fives are due to pneumonia. Case fatality rates in hospitalized children are reported to be between 8.7% and 47% [9-12].

This study was designed to study the sociodemographic and clinical profile of children hospitalized with pneumonia and possible correlation to duration of stay at a tertiary health care center.

METHODOLOGY

This was a prospective study done on children admitted with community-acquired pneumonia at Belagavi Institute of Medical Sciences, Belagavi, Karnataka, a teaching hospital. After obtaining the Institutional Ethics Committee approval, this study was undertaken during December 2013-March 2015. Children aged more than 2 months to 18 years of age were studied, who met the inclusion criteria of fever and cough for duration of <14 days with any one of the following: Tachypnea, chest in-drawing, poor feeding, no response to appropriate

oral antibiotics, toxic appearance, and any of the auscultatory findings such as crepitation/bronchial breath sounds/reduced breath sounds and radiologically proven pneumonia [6]. Children with known heart disease/chronic lung diseases/case of acquired immunodeficiency syndrome/tuberculosis were excluded from the study as they could have bearing on the duration of stay.



The purpose of the study was explained, and written consent was obtained from the parents of the children before enrolling into the study. A pre-designed preform was used to collect information regarding age, sex, sociodemographic profile, presenting complaints such as duration of fever, cough, hurried breathing, chest in drawing, and decreased feeding, lethargy, and convulsions. Relevant past and family history were also taken. Eligible children were given injection crystalline penicillin 2 lakh IU/kg in four divided doses after drug sensitivity testing after admitting in pediatrics ward. Complete blood count, erythrocyte sedimentation rate, chest X–ray, and blood culture were investigated. Children were assessed every 12 hourly, for respiratory rate, pulse rate, SPO_2, blood pressure, and signs of respiratory distress. The ARI classification was done on the basis of the WHO criteria. The association between risk factors and hospital stay noted.

RESULTS

A total of 84 children were studied, 48 boys and 36 girls. There were 24 children in the age group of 2-24 months, 33 in 1-5 years, and 22 children aged between 5 and 18 years. Maximum numbers of children were in low socioeconomic group (43 in upper lower and 37 in lower group) according to modified Kuppuswamy classification. Passive smoking was present in 40.5% of studied and overcrowding was seen in 51% of children studied. 44% of children were breastfed for <6 months, and 30.64% were partially immunized (Table 1).

Maximum number of children with pneumonia belongs to low socioeconomic status (SES) which is statistically significant.

A significant association between the children with duration of symptoms <4 days before hospitalization stayed for <7 days in the hospital, across all the age groups studied (Table 2).

There was no association between duration of stay with either SES or overcrowding. There was no mortality in the study, and all children were discharged. A significant association between passive smoking and duration of stay was seen (Chi-square=3.953 and p=0.047) (Table 3).

Table 1: Sociodemographic profile (n=84)

Parameters	Frequency (%)	Chi-square	p value
Socioeconomic status			
III	4 (5)	31.5	<0.001*
IV	43 (51.19)		
V	37 (44.5)		
Overcrowding			
Present	43 (51)	0.05	>0.05
Absent	41 (49)		
Passive smoking			
Present	34 (40.5)	3.05	>0.05
Absent	50 (60)		
Anemia			
Present	47 (55.9)	1.19	>0.05
Absent	37 (44.04)		
Immunization status			
Completely immunized	43	12.22	<0.001*
Partially immunized	19		
Not immunized	22		

*Significant

Table 2: Relation of duration of stay with complaints

Duration of hospital stay	Complaints before hospitalization
	<4 days (%)
<–7	55 (73)
>7	11 (27)
Chi-square	29.34
p value	<0.01

Table 3: Duration of stay with social factors

Parameters	Stay ≤7 days	Stay >7 days
Socioeconomic status		
III	4	0
IV	35	8
V	32	5
Chi-square=1.057 and p=0.59		
Overcrowding		
Present	34	9
Absent	37	4
Chi-square=2.003 and p=0.157		
Passive smoking		
Present	25	9
Absent	45	5

Chi-square=3.953 and p=0.047

DISCUSSION

Although there is not much difference in sex distribution, the majority of children were in the age group of 1-5 years. The results of the (42%) which is comparable to studies done by Raquel et al. [13] and Nirjala et al. [14]. In studies done by Tiewsoh et al., [15] (2008) and Onyango et al. [16] (2012), 68% and 67.7% of the children were from low SES, respectively. However, in our study, majority of children 95.2% belonged to low SES (class IV+V). However, a study by Walia et al. [17] per capita income did not show any correlation with ARI. Victoria et al. [18] also revealed that family income was not associated with risk of pneumonia.

A study done by Boor et al. [19] showed that inadequate immunization for age was significantly associated with acute lower respiratory infections (ALRI) (70.2% of children inadequately immunized developed pneumonia as against 49.2% of children who were appropriately immunized). In our study, among children of age <5 years, 43 (69.35%) were completely immunized, and 19 of 62 (30.64%) children were partially immunized significantly associated with ALRI. This may be seen as the majority of the children are exposed to overcrowding, smoking, hailed from low socioeconomic state, and majority children were anemic.

A study done by Savitha et al. [20] showed that overcrowding was significantly related to the occurrence of ALRI in under five children (ALRI: 91.4% of children with overcrowding developed pneumonia, whereas only 20.2% of children without overcrowding developed pneumonia). Overcrowding was seen in 51% of children in our study though statistically not significant.

Broor et a1. [19] and Savitha et al. [20] in India have shown that there was no significant association between parental smoking and respiratory infections. Although in studies by Mukhopadhaya et al. [21], Suzuki et al. [22] found that exposure to environmental tobacco smoking was associated with hospital admission of children for pneumonia and Naik et al. [23] found that deaths were more in cases with a family history of smoking. Similarly, in the present study, children exposed to passive smoking had prolonged duration of hospital stay. In the present study, 47 of 84 (55.95%) of children had anemia. Ramakrishnan and Harish [24] observed low hemoglobin level as a risk factor and found that anemic children were 5.75 times more susceptible to ALRI. A study done by Savitha et al. [20] in Mysore showed that anemia was present in 76.9% of ALRI cases compared to 6.7% of controls.

The mean duration of hospital stay was 5.8 days. Children with duration of symptoms <4 days before hospitalization stayed for <7 days in the hospital, irrespective of age group in the present study. Similar result was observed in a study by Naik et al., [23] in Maharashtra state of India. Observations in the present study did not reveal a statistically significant association between duration of stay and the studied parameters such as SES or overcrowding across all the age groups studied. Although in studies by Mukhopadhaya et al. [21], Suzuki et al. [22] found that exposure to environmental tobacco smoking was associated with hospital admission of children for pneumonia and Naik et al. [23] found that deaths were more in cases with a family history of smoking. Being an observational study with small sample size was limitation of the study. Complication of pneumonia not studied in this study, although complications can prolong the hospital stay.

CONCLUSION

With this study, we can conclude that children who got early medical attention (<4 days) stayed for less period of time in the hospital (<7 days). Children exposed to passive smoking had a longer duration of stay. SES and other risk factors studied did not have any bearing on the duration of stay in the hospital.

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